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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/075,666	05/11/1998	TETSUJIRO KONDO	450100-2780.	3934

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EXAMINER
CHANG, JON CARLTON

ART UNIT	PAPER NUMBER
2623	18

DATE MAILED: 04/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/075,666	KONDO, TETSUJIRO	
	Examiner	Art Unit	
	Jon Chang	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-14* is/are allowed.

6)☒ Claim(s) *15-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

Response to Applicants' Arguments

1. The response filed February 3, 2003, has been entered and made of record.

Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons. Applicant states (page 2) that claim 1 requires "said class data obtained by learning with at least a training digital image having a high resolution component." Applicant concludes that the invention of claim 1 is therefore based upon "a high resolution image". Applicant then argues (page 3) that Kanno does not rely on a training digital image having a high resolution component, but instead teaches an interpolation procedure to generate a high resolution image and pre-storing this high resolution data so that it is readily available.

The Examiner wishes to first point out that claim 1 stands allowed. The Examiner does not consider any arguments with regard to claim 1 to be relevant. The Examiner assumes the arguments are intended to apply to claim 15.

In response to the first point raised by Applicant, although not affecting the applicability of Kanno, the Examiner wishes to make clear that that while claim 15 does call for "a training digital image having said high resolution component," this does not require that the training digital image be a "high resolution image." It is known in the art that digital images may contain a plurality of components. Having one of the components in a digital image be of high resolution does not necessarily make the entire digital image high resolution. So, the Examiner does not agree that the claim requires learning based on a high resolution training image. The claim only requires the

training digital image have a high resolution component. A high resolution digital image, however, does contain a high resolution component.

Furthermore, contrary to Applicants' position, Kanno's training digital images are of high resolution (and therefore contain a high resolution component as required by the claim). While Kanno's invention does utilize interpolation to convert a low resolution image into a high resolution image (column 1, lines 35-37; note that Kanno uses the equivalent term "density"), Kanno also states that the training digital image (referred to by Kanno as "learning image data") "are represented at a **predetermined resolution which agrees** with a scanning line density of the recording of a **resultant of an interpolation** of input image data" (column 3, lines 50-53, emphasis added). The resultant of interpolation, as clearly indicated by Kanno, and as pointed out by Applicant, is a high resolution image. Thus the predetermined resolution of the learning image data is of high resolution. Therefore, the training digital image of Kanno has a high resolution component.

With regard to the other, non-allowed claims, Applicant relies on the arguments noted above. The Examiner relies on his response given above for these claims as well.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 15, 17, 19, 21, 22, 33, 35-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al. (US 5,229,868) in view of Matsumura (US 5,148,499).

As to claims 15 and 33, Kanno discloses a digital signal conversion apparatus (figures 1 and 4) which includes:

-a memory for storing class data for respective classes at addresses corresponding to said respective classes (figure 11, items 3 and 9; addresses in the memory are inherent), said class data obtained by learning associated with at least a training digital image signal (figure 11, item 2; column 10, lines 17-23). The training image signal has a high resolution component (see column 1, lines 35-45);

-means for receiving first digital image signal including pixel data (figure 11, item 4);

-means for clustering (figure 12, item 19 clusters input signal into a class designated by r1-r16) pixel data in accordance with adjacent pixel data of the second digital image signal (e.g., r6 and r7 are adjacent to h1) to produce a class;

-means for retrieving class data from one of the addresses of the memory corresponding to the class of the first digital image signal (the class r1-r16 is used to address the memory to retrieve the class data h1-h3; figure 3); and

-means for generating pixel data representing pixel values of the second digital image signal based upon at least the retrieved class data (figures 1 or 11, item 7). See column 4, lines 32-41.

With regard to "generating all pixel data," Kanno generates all data since the interpolation circuit, as shown for example in Fig.4 does "generate" all of the pixel data representing pixel values of the second digital image by producing (i.e., generating) the pixel data at the terminal 15. Kanno does not explicitly teach generating all of pixel data "in the same manner in accordance with a common algorithm" as claimed. However, this is extremely old and well known in the art. For example, Matsumura teaches this (see for example, Fig.2B, and column 4, lines 27-32). As explained in Matsumura, the technique provides the advantage of preventing image deterioration (e.g., column 2, lines 51-57). Therefore, it would have been obvious to one of ordinary skill in the art to modify Kanno according to Matsumura in order to obtain this advantage.

Claims 19 and 36 recite a method which generally corresponds to the apparatus of claims 15 and 19 and are rejected on the same grounds.

As to claims 22, 35 and 38, Kanno teaches that the class data stored in memory corresponds to pixel data representing the second standard (i.e., higher resolution; see figure 2, h1-h3) and the means for generating generates pixel data representing the second image signal by providing the retrieved class data as pixel data representing pixel values. See column 4, lines 38-41.

With regard to claims 17 and 21, Kanno does not teach the use of an orthogonal decoding to provide the input digital signal. Kanno does teach that the image

processing system is intended to be used with facsimile communication (column 1, lines 1-25). It is common in the art to transmit facsimile digital signals using orthogonal coding (the Examiner takes official notice of this fact). It would have been obvious to one of ordinary skill in the art, to include an orthogonal decoder in the image input device because Kanno et al. teaches that the system is to be used in the facsimile environment which commonly includes such encoding of digital signals.

4. Claims 18, 23, 25, 26, 27, 30, 32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al. (US 5,229,868) and Matsumura (US 5,148,499), and further in view of Collins (US 4,587,556).

To the extent that these claims mirror the language of claims 15, 19, 33 and 36 above, Kanno applies as already discussed above.

As to claims 23, 27 and 30, Kanno does not specifically deal with standard and high definition *video* signals. However, conversion from a standard (i.e., lower) definition video signal standard (i.e., NTSC at 525 lines/field) to a higher definition video signal standard (i.e., PAL at 625 lines/field) is well known in the art. Collins, for example, discloses a system and method for performing this function. See figures 2, 4 and 5 as well as the Abstract and column 5, lines 19-27. Given the fact that using interpolation to convert between video signals is well known, it would have been obvious to one of ordinary skill in the art to utilize the specific interpolation processes taught by Kanno for converting *video* signals in order to obtain the image quality advantages that reference teaches (by using learning image data, etc.) when converting

a video signal. Note additionally that, although Kanno does not discuss video signals, the possibility of interpolating video data in the same way is not excluded since the mechanics of interpolating a single still-frame image such as in Kanno would not, in principle, be different from interpolating a single frame of a continuous stream of video data.

As to claim 25, Kanno teaches that the class data stored in memory corresponds to pixel data representing the second standard (i.e., higher resolution; see figure 2, h1-h3) and the means for generating generates pixel data representing the second image signal by providing the retrieved class data as pixel data representing pixel values. See column 4, lines 38-41.

Claims 18, and 32 recite generally similar limitations and are rejected on the same ground as applied to claim 25 above.

As to claim 26, Kanno teaches means for generating the class data (column 5, lines 9-19).

5. Claims 16, 20, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al. (US 5,229,868) and Matsumura (US 5,148,499), and further in view of Tararine et al. (US 5,048,102).

As applied to claims 15, 19, 33 and 36 above, Kanno does not teach that the class data is coefficient data and the means for generating the second image data operates in accordance with the coefficient data. Kanno teaches data conversion using stored interpolated values which have already been computed. Tararine et al. teaches

that these two methods are equivalents in the art (column 7, line 15 through column 8, line 7). It would have been obvious to one of ordinary skill in the art to replace the direct accessing of the interpolation data taught by Kanno et al. with a method that computes the interpolation data from weights or coefficients. Because Tararine et al teaches that these methods are equivalents, use of one or the other would have been an obvious and routine substitution dictated by constraints or requirements of a particular designer.

6. Claims 24, 28, 29, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al. (US 5,229,868), Matsumura (US 5,148,499) and Collins (US 4,587,556) as applied to claim 23 above, and further in view of Tararine et al. (US 5,048,102).

Kanno does not teach that the class data is coefficient data and the means for generating the second image data operates in accordance with the coefficient data. Kanno teaches data conversion using stored interpolated values which have already been computed. Tararine et al. teaches that these two methods are equivalents in the art (column 7, line 15 through column 8, line 7). It would have been obvious to one of ordinary skill in the art to replace the direct accessing of the interpolation data taught by Kanno et al. with a method that computes the interpolation data from weights or coefficients. Because Tararine et al teaches that these methods are equivalents, use of one or the other would have been an obvious and routine substitution dictated by constraints or requirements of a particular designer.

Claim 29 recites generally similar limitations and are rejected on the same ground as applied to claim 25 above.

Allowable Subject Matter

7. Claims 1-14 are allowable over the prior art of record.

Reasons for indicating allowable subject matter were given in a previous office action, paper no. 4, and incorporated herein by reference.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

Jon Chang
Primary Examiner
Art Unit 2623

Jon Chang
April 14, 2003